Amendments to the Claims

1 (amended). A method of instigating an event apart from reconstructing video and audio at a television receiver comprising the steps of:

    (a)   generating a reconstructed application time including an application time moment that is a function of a current moment of a system time, a sample application time moment, and a sample moment of a system time associated with said sample application time moment that is based, at least in part, upon a delay in a packetization process; and

    (b)   instigating said event apart from said reconstructing said video and audio at a moment of said reconstructed application time.

2 (amended). A method of synchronizing an event to an instant of at least one of a video, audio, and data program element comprising the steps of:

    (a)   generating a reconstructed application time including an application time moment that is a function of a current moment of a system time, a sample application time moment, and a sample moment of a system time associated with said sample application time moment that is based, at least in part, upon a delay in a packetization process;

    (b)   associating said event and said instant with a correlating application time;

    (c)   associating said correlating application time with a presentation moment of said system time for said instant; and

    (d)   instigating said event at said reconstructed application time corresponding to said correlating application time.

3 (original). The method of claim 2 wherein said sample moment of said application time is associated with said sample moment of said system time by the step of incorporating said

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sample moment of said application time in a data unit to be presented at a presentation moment approximately corresponding to said sample moment of said system time.

4 (original). The method of claim 2 wherein the step of associating said correlating application time with said presentation moment for said instant comprises the step of incorporating said instant in a data unit at approximately said correlating time, said data unit to be presented at said presentation moment.

5 (original). The method of claim 2 further comprising the step of presenting said instant at said presentation moment.

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6 (amended). A method of synchronizing an event to an instant of at least one of a video, audio, and data program element comprising the steps of:

    (a)   associating a sample application time moment with a sample system time moment that is based, at least in part, upon a delay in a packetization process;

    (b)   using said associated sample application time moment and said sample system time moment to synchronize a reconstructed application clock and a system clock;

    (c)   associating said event and said instant of said program element with a correlating application time moment;

    (d)   relating said correlating application time moment and presentation of said instant and said correlating application time moment to a presentation moment of said system time for said instant; and

    (e)   instigating said event at a time moment generated by said reconstructed application clock corresponding to said correlating application time moment.

7 (original). The method of claim 6 wherein said sample application time moment is associated with said sample system time moment by the step of incorporating said sample application time moment in a data unit to be presented at said sample system time moment.

8 (original). The method of claim 7 wherein the step of incorporating said sample application time moment in a data unit to be presented at said system time moment comprises the steps of:

    (a)   selecting a moment from an application timeline generated by an application clock;

    (b)   determining said sample application time moment by adjusting said selected moment for a period required to generate said data unit; and

    (c)   incorporating said sample application time moment in said data unit at said sample application time moment; and

    (d)   timestamping said data unit for presentation at said sample system time moment.

9 (original). The method of claim 6 wherein synchronization of said reconstructed application clock and said system clock comprises the steps of:

    (a)   comparing a current system time moment to said sample system time moment; and

    (b)   setting a current moment of time generated by said reconstructed application clock equal to said associated sample application time moment when said current system time moment corresponds is equivalent to said sample system time moment.

10 (original). The method of claim 6 wherein the step of relating presentation of said instant and said correlating application timerelating said correlating application time moment and said presentation moment of said system time for said instant moment with a presentation moment of said system time comprises the step of incorporating said instant in a data unit at approximately said correlating application time moment, said data unit to be presented at said presentation moment.

11 (original). The method of claim 6 further comprising the step of presenting said instant at said presentation moment of said system time.

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12 (amended). A method of synchronizing an event at a digital television receiver to an instant of at least one of a transmitted video, audio, and data television program element comprising the steps of:

(a) incorporating a sample application time moment in a first data unit to be presented at a first data unit presentation moment of a system time that is based, at least in part, upon a delay in a packetization process;

(b) employing said sample application time moment and said first data unit presentation moment to synchronize a reconstructed application time at said receiver to said system time;

(c) correlating said event and said instant with a correlating moment of an application time;

(d) transmitting said instant to said receiver in a second data unit having a second data unit presentation moment of system time associated with said correlating moment of said application time;

(e) presenting said instant at said second data unit presentation moment; and

(f) instigating said event when said reconstructed application time corresponds to said correlating moment.

13 (original). The method of claim 12 wherein said step of incorporating saida sample application time moment in said a first data unit having an associated ato be presented at said first data unit presentation moment of asaid system time comprises the steps of:

(a) selecting a moment from an application timeline generated by an application clock;

(b) determining said sample application time moment by adjusting said selected moment for a period required to generate said first data unit; and

(c) incorporating said sample application time moment in said first data unit at approximately said sample application time moment.

14 (original). The method of claim 12 wherein the step of employing said sample application time moment and said first data unit presentation moment to synchronize said a reconstructed application time at said receiver to said system time comprises the steps of:

    (a)   comparing a current system time to said first data unit presentation moment; and

    (b)   setting a current moment of said reconstructed application time equal to said sample application time moment when said current system time corresponds to said first data unit presentation moment.

15 (original). The method of claim 12 wherein the step of transmitting said instant to said receiver in said second data unit having a said second data unit presentation moment of system time associated with said correlating moment of said application time comprises the steps of:

    (a)   pushing encoding said instant in said second data unit to an encoder at approximately said correlating application time;

    (b)   encoding said instant in said second data unit;

    (c)   timestamping said second data unit for presentation at said second data unit presentation moment; and

    (d)   transmitting said second data unit to said receiver.

16.   The method of claim 12 further comprising the steps of:

    (a)   specifying said correlating moment in a third data unit; and

    (b)   transmitting said third data unit to said receiver in anticipation of said correspondence of said reconstructed application time and said correlating moment.

17 (original). The method of claim 12 further comprising the step of specifying said correlating moment in either of a third data unit having a third data unit presentation moment and said first data unit, said third data unit presentation moment having a temporal relation to said first data unit presentation moment.

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18 (amended). A method of synchronizing an event <u>apart from reconstructing video and audio</u> at a television receiver to an instant of at least one of a transmitted video, audio, and data program element comprising the steps of:

(a)   generating a system time;

(b)   generating an application time;

(c)   selecting a sample moment of said application time;

(d)   incorporating said sample moment of said application time in a first data unit to be presented at a first data unit presentation moment of said system time;

(e)   generating a reconstructed application time synchronized to said system time by said sample moment and said first data unit presentation moment;

(f)   associating said event and said instant of said program element with a correlating moment of said application time;

(g)   associating said correlating moment with an instant presentation moment;

(h)   presenting said instant at a system time corresponding to said instant presentation moment; and

(i)   instigating said event <u>apart from reconstructing video and audio</u> at a moment of said reconstructed application time corresponding to said correlating moment.

19. (original) 1/25/05 The method of claim 18 wherein the step of generating said reconstructed application time synchronized to said system time by said sample moment and said first data presentation moment comprises the steps of:

(a)   comparing said system time to said first data unit presentation moment;

(b)   initializing said reconstructed application time to said sample moment when said system time corresponds to said first data unit presentation moment; and

(c)   incrementing said reconstructed application time at an application time unit frequency.

20 (original). The method of claim 19 wherein the step of incrementing said reconstructed application time at an application time unit frequency comprises the steps of:

(a)   dividing a signal having a system time unit frequency to obtain a trigger signal having said application time unit frequency; and

(b)   incrementing said reconstructed application time in response to said trigger signal.

21 (original).   The method of claim 18 wherein the step of selecting said sample moment of said application time comprises the step of selecting a moment of said application time adjusted for a period required to create said first data unit.

22 (original).   The method of claim 18 wherein the step of associating said correlating moment with said instant presentation moment comprises the steps of:

(a)   encoding said instant in a second data unit at said application time corresponding approximately to at approximately said correlating moment and

(b)   timestamping said second data unit for presentation at a system time corresponding to said instant presentation moment.

23 (original).   The method of claim 18 further comprising the steps of

(a)   incorporating said correlating moment in a second data unit; and

(b)   transmitting said second data unit to said receiver.

24 (original).   The method of claim 23 wherein said second data unit is transmitted to said receiver prior to said reconstructed application time corresponding to said correlating moment.

25 (original).   The method of claim 18 further comprising the steps of specifying said correlating moment in either of said first data unit and a second third data unit having a second data unit presentation moment and said first data unit, said second data unit presentation moment having a fixed temporal relation to said first data unit presentation moment.

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26 (amended).   The method of claim 18 further comprising the steps of:

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(a)   specifying said correlating moment in a second third data unit having a second data unit presentation moment having a fixed temporal relation to said first data unit presentation moment; and

(b)   including said second data unit and said first data unit in a common stream of data units.

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27 (amended). A method of generating a reconstructed application time synchronized to a system time comprising the steps of:

(a)   generating an application time;

(b)   generating a system time;

(c)   selecting a reference moment of said application time;

(d)   incorporating said reference moment in a data access unit having a data access unit having a data access unit presentation moment of said system time that is based upon a delay, at least in part, upon a packetization process;

(e)   recovering said reference moment and said data access unit presentation moment from said data access unit; and

(f)   adjusting a clock to produce a moment of said reconstructed application time equal to a function of said reference moment, said data access unit presentation moment, and a current moment of said system time.

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28 (amended). A clock to generate a reconstructed application time synchronized to a system time comprising:

(a)   an application clock generating an application time;

(b)   a sampler designating a moment of said application time as a reference moment;

(c)   a packet generator to incorporate said reference moment in a data access unit having a data access unit presentation moment of said system time that is based upon a delay, at least in part, upon a packetization process;

(d)   a depacketizer to recover said reference moment and said data access unit presentation moment from said data access unit; and

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(e)   an application time recovery unit generating a said reconstructed application time including a moment equal to a function of said reference moment, said data access unit presentation moment, and a current moment of said system time.

29 (canceled). An application time clock comprising:

(a)   a system time signal having a system time unit frequency;

(b)   a divider dividing said system time unit frequency to produce a trigger signal having an application time unit frequency; and

(c)   a counter incremented by said trigger signal to output an application time moment.

30 (canceled). The apparatus of claim 29 further comprising:

(a)   a system time counter to construct a system time from said system time signal;

(b)   a mask to reduce a resolution of said system time;

(c)   a comparator to compare a moment of said reduced resolution system time to a presentation time stamp; and

(d)   a register to load an application time moment associated with said presentation time stamp into said counter when said presentation stamp and said moment of reduced resolution system time correspond.

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31 (amended). An apparatus for synchronizing an event <u>apart from reconstructing video and audio</u> to an instant of at least one of a synchronized video, audio, and data program element comprising:

(a)   a system clock generating a system time;

(b)   an application clock generating an application time;

(c)   a sampler selecting a moment of said application time as an application time sample;

(d)   an editor designating a correlating application time associating said event <u>apart from reconstructing video and audio</u> and said instant;

(e)   a first data unit generator to generating at said correlating application time a first data unit comprising said application time sample and a first data unit presentation moment of said system time;

(f)   a second data unit generator generating a second data unit comprising said correlating application time and a descriptor of said event <u>apart from reconstructing video and audio</u>;

(g)   a third data unit generator generating at said correlating application time a third data unit comprising said instant and a third data unit presentation moment of said system time, said third data unit presentation moment associated with said correlating application time;

(h)   a depacketizer to recover said application time sample, said first data presentation moment, said correlating application time, said instant, and said third data unit presentation moment from said first, second second, and third data units;,

(i)   an application time recovery unit generating a reconstructed application time including a moment equal to a function of said application time sample, said first data unit presentation moment, and a current system time moment;

(j)   a presentation unit to present said instant at said third second data unit presentation time, and

(k)   a presentation engine to instigate said event <u>apart from reconstructing video and audio</u> when said reconstructed application time corresponds to said correlating moment.

32.(original)   The apparatus of claim 31 wherein said second data unit further comprises a descriptor of said event.

33 (original).   The apparatus of claim 31 wherein said second data unit generator comprises:

(a)   a access unit generator constructing a payload for said data unit comprising said application time sample;

(b)   a data server directing said access unit generator to construct said payload at a moment of said application time approximately corresponding to said application time sample; and

(c)   a multiplexer adding a header comprising said second data unit presentation time to said payload.

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34 (amended). An apparatus for synchronizing an event <u>apart from reconstructing video and audio</u> to an instant of at least one of a synchronized video, audio, and data program element comprising:

(a)   a system clock generating a system time;

(b)   an application clock generating an application time;

(c)   a sampler selecting a moment of said application time as an application time sample;

(d)   an editor designating a correlating moment associating said event <u>apart from reconstructing video and audio</u> and said instant;

(e)   a data unit generator generating a data stream comprising at least one data unit including said application time sample, an application time sample presentation moment, said instant, an instant presentation moment, and said correlating moment;

(f)   a depacketizer to recover said application time sample, said application time sample presentation moment, said correlating moment, said instant and said instant presentation moment from said data stream,

(g)   an application time recovery unit generating a reconstructed application time including a moment equal to a function of said application time sample, said application time sample presentation moment, and a current system time moment;

(h)   a presentation unit to present said instant at said instant presentation moment, and

(i)   a presentation engine to instigate said event <u>apart from reconstructing video and audio</u> when said reconstructed application time corresponds to said correlating moment.

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35 (amended). A method of synchronizing an event <u>apart from reconstructing video and</u> <u>audio</u> at a digital television receiver to an instant of at least one of a transmitted video, audio, and data television program element comprising the steps of:

(a)   correlating said event <u>apart from reconstructing video and audio</u> and said instant with a correlating moment of application time;

(b)   incorporating a sample application time moment in a data unit for presentation at a sample application time presentation moment of a system time;

(c)   employing said sample application time moment and said sample application time presentation moment to synchronize an reconstructed application time to said system time;

(d)   incorporating said instant in a data unit having an instant presentation moment, said instant presentation moment being associated with said correlating moment;

(e)   presenting said instant at said instant presentation moment; and

(f)   instigating said event <u>apart from reconstructing video and audio</u> when said reconstructed application time corresponds to said correlating moment.

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